



**[4910-13]**

## **DEPARTMENT OF TRANSPORTATION**

### **Federal Aviation Administration**

#### **14 CFR Part 25**

#### **Docket No. FAA-2012-0325; Notice No. 25-459-SC**

**Special Conditions:** Airbus, A350-900 Series Airplane; Passenger Seats with Non-Traditional, Large, Non-Metallic Panels.

**AGENCY:** Federal Aviation Administration (FAA), DOT.

**ACTION:** Final special conditions, request for comments.

**SUMMARY:** These special conditions are issued for the Airbus A350-900 series airplane.

These airplanes will have a novel or unusual design feature(s) associated with seats that include non-traditional, large, non-metallic panels that would affect survivability during a post-crash fire event. The applicable airworthiness regulations do not contain adequate or appropriate safety standards for this design feature. These special conditions contain the additional safety standards that the Administrator considers necessary to establish a level of safety equivalent to that established by the existing airworthiness standards.

**DATES:** The effective date of these special conditions is March 14, 2012. We must receive your comments by **[insert a date 45 days after date of publication in the Federal Register]**.

**ADDRESSES:** Send comments identified by docket number **[FAA-2012-0325]** using any of the following methods:

- Federal eRegulations Portal: Go to <http://www.regulations.gov/> and follow the online instructions for sending your comments electronically.

- Mail: Send comments to Docket Operations, M-30, U.S. Department of Transportation (DOT), 1200 New Jersey Avenue, SE., Room W12-140, West Building Ground Floor, Washington, D.C., 20590-0001.
- Hand Delivery or of Courier: Take comments to Docket Operations in Room W12-140 of the West Building Ground Floor at 1200 New Jersey Avenue, S.E., Washington, D.C., between 8 a.m., and 5 p.m., Monday through Friday, except Federal holidays.
- Fax: Fax comments to Docket Operations at 202-493-2251.

Privacy: The FAA will post all comments it receives, without change, to <http://www.regulations.gov/>, including any personal information the commenter provides. Using the search function of the docket web site, anyone can find and read the electronic form of all comments received into any FAA docket, including the name of the individual sending the comment (or signing the comment for an association, business, labor union, etc.). DOT's complete Privacy Act Statement can be found in the Federal Register published on April 11, 2000 (65 FR 19477-19478), as well as at <http://DocketsInfo.dot.gov/>.

Docket: Background documents or comments received may be read at <http://www.regulations.gov/> at any time. Follow the online instructions for accessing the docket or go to the Docket Operations in Room @W12-140 of the West Building Ground Floor at 1200 New Jersey Avenue, SE., Washington, D.C., between 9 a.m., and 5 p.m., Monday through Friday, except Federal holidays.

**FOR FURTHER INFORMATION CONTACT:** Jeff Gardlin, FAA, Airframe/Cabin Safety, ANM-115, Transport Airplane Directorate, Aircraft Certification Service, 1601 Lind Avenue SW., Renton, Washington, 98057-3356; telephone (425) 227-2136; facsimile (425) 227-1320.

## **SUPPLEMENTARY INFORMATION:**

### **Comments Invited**

We invite interested people to take part in this rulemaking by sending written comments, data, or views. The most helpful comments reference a specific portion of the special conditions, explain the reason for any recommended change, and include supporting data.

We will consider all comments we receive by the closing date for comments. We will consider comments filed late if it is possible to do so without incurring expense or delay. We may change these special conditions based on the comments we receive.

### **Background**

On August 25, 2008, Airbus applied for a type certificate for their new A350-900 series airplane. Later, Airbus requested and the FAA approved an extension to the application for FAA type certification to June 28, 2009. The A350-900 series has a conventional layout with twin wing-mounted Rolls Royce Trent engines. It features a twin aisle 9-abreast economy class layout, and accommodates side-by-side placement of LD-3 containers in the cargo compartment. The basic A350-900 series configuration accommodates 315 passengers in a standard two-class arrangement. The design cruise speed is Mach 0.85 with a Maximum Take-Off Weight of 591,000 lbs. Airbus proposes the A350-900 series to be certified for extended operations (ETOPS) beyond 180 minutes at entry into service for up to a 420-minute maximum diversion time.

The applicable airplane regulations, Title 14, Code of Federal Regulations (14 CFR) part 25, do not require seats to meet the more-stringent flammability standards required of large, non-metallic panels in the cabin interior. At the time the applicable rules were written, seats were

designed with a metal frame covered by fabric, not with large, non-metallic panels. Seats also met the then-recently adopted standards for flammability of seat cushions. With the seat design being mostly fabric and metal, the contribution to a fire in the cabin had been minimized and was not considered a threat. For these reasons, seats did not need to be tested to heat-release and smoke-emission requirements.

Seat designs have now evolved to occasionally include non-traditional, large, non-metallic panels. Taken in total, the surface area of these panels is on the same order as the sidewall and overhead stowage bin interior panels. To provide the level of passenger protection intended by the airworthiness standards, these non-traditional, large, non-metallic panels in the cabin must meet the standards of part 25, Appendix F, parts IV and V, heat-release and smoke-emission requirements.

### **Type Certification Basis**

Under Title 14, Code of Federal Regulations (14 CFR) 21.17, Airbus must show that the A350-900 series meets the applicable provisions of 14 CFR part 25, as amended by Amendments 25-1 through 25-128.

The FAA has determined that Airbus A350-900 series airplanes must comply with the following sections: § 25.853(a) and § 25.853(c), and Amendment 25-61 and Amendment 25-66.

If the Administrator finds that the applicable airworthiness regulations (i.e., 14 CFR part 25) do not contain adequate or appropriate safety standards for the A350-900 series because of a novel or unusual design feature, special conditions are prescribed under § 21.16.

Special conditions are initially applicable to the model or series for which they are issued. Should the type certificate for that model be amended later to include any other model that

incorporates the same or similar novel or unusual design feature, the special conditions would also apply to the other model under § 21.101.

In addition to the applicable airworthiness regulations and special conditions, the A350-900 series must comply with the fuel vent and exhaust emission requirements of 14 CFR part 34, the noise certification requirements of 14 CFR part 36, and the FAA must issue a finding of regulatory adequacy under § 611 of Public Law 92-574, the "Noise Control Act of 1972."

The FAA issues special conditions, as defined in § 11.19, under § 11.38, and they become part of the type-certification basis under § 21.17(a)(2).

### **Novel or Unusual Design Features**

The A350-900 series will incorporate the following novel or unusual design features: passenger seats that incorporate non-traditional, large, non-metallic panels in lieu of the traditional metal frame covered by fabric. The flammability properties of these panels have been shown to significantly affect the survivability of occupants of the cabin in the case of fire. These seats are considered a novel design for transport category airplanes that include Amendment 25-61 and Amendment 25-66 in the certification basis, and were not considered when those airworthiness standards were established.

The existing regulations do not provide adequate or appropriate safety standards for seat designs that incorporate non-traditional, large, non-metallic panels. In order to provide a level of safety that is equivalent to that provided by the balance of the cabin, additional airworthiness standards, in the form of special conditions, are necessary. These special conditions supplement § 25.853. The requirements contained in these special conditions consist of applying the

identical test conditions required of all other large panels in the cabin, to seats with non-traditional, large, non-metallic panels.

#### Definition of “Non-Traditional, Large, Non-Metallic Panel”

A non-traditional, large, non-metallic panel, in this case, is defined as a panel with exposed-surface areas greater than 1.5 square feet installed per seat place. The panel may consist of either a single component or multiple components in a concentrated area. Examples of parts of the seat where these non-traditional panels are installed include, but are not limited to: seat backs, bottoms and leg/foot rests, kick panels, back shells, credenzas and associated furniture. Examples of traditional exempted parts of the seat include: arm caps, armrest close-outs such as end bays and armrest-styled center consoles, food trays, video monitors and shrouds.

#### Clarification of “Exposed”

“Exposed” includes those panels directly exposed to the passenger cabin in the traditional sense, plus those panels enveloped such as by a dress cover. Traditional fabrics or leathers currently used on seats are excluded from these special conditions. These materials must still comply with § 25.853(a) and § 25.853(c) if used as a covering for a seat cushion, or § 25.853(a) if installed elsewhere on the seat. Non-traditional, large, non-metallic panels covered with traditional fabrics or leathers will be tested without their coverings or covering attachments.

#### **Discussion**

In the early 1980s the FAA conducted extensive research on the effects of post-crash flammability in the passenger cabin. As a result of this research and service experience, the FAA adopted new standards for interior surfaces associated with large surface area parts.

Specifically, the rules require measurement of heat release and smoke emission (part 25, Appendix F, parts IV and V) for the affected parts. Heat release has been shown to have a direct correlation with post-crash fire survival time. Materials that comply with the standards (i.e., Sec. 25.853 entitled "Compartment interiors" as amended by Amendment 25-61 and Amendment 25-66) extend survival time by approximately 2 minutes over materials that do not comply.

At the time these standards were written the potential application of the requirements of heat release and smoke emission to seats was explored. The seat frame itself was not a concern because it was primarily made of aluminum and there were only small amounts of non-metallic materials. It was determined that the overall effect on survivability was negligible, whether or not the food trays met the heat release and smoke requirements. The requirements therefore did not address seats. The preambles to both the Notice of Proposed Rule Making (NPRM), Notice No. 85-10 (50 FR 15038, April 16, 1985) and the Final Rule at Amendment 25-61 (51 FR 26206, July 21, 1986), specifically note that seats were excluded "because the recently-adopted standards for flammability of seat cushions will greatly inhibit involvement of the seats."

Subsequently, the Final Rule at Amendment 25-83 (60 FR 6615, March 6, 1995) clarified the definition of minimum panel size: "It is not possible to cite a specific size that will apply in all installations; however, as a general rule, components with exposed-surface areas of one square foot or less may be considered small enough that they do not have to meet the new standards. Components with exposed-surface areas greater than two square feet may be considered large enough that they do have to meet the new standards. Those with exposed-surface areas greater than one square foot, but less than two square feet, must be considered in

conjunction with the areas of the cabin in which they are installed before a determination could be made."

In the late 1990s, the FAA issued Policy Memorandum 97-112-39, Guidance for Flammability Testing of Seat/Console Installations, October 17, 1997 (<http://rgl.faa.gov>). That memo was issued when it became clear that seat designs were evolving to include large, non-metallic panels with surface areas that would impact survivability during a cabin fire event, comparable to partitions or galleys. The memo noted that large surface area panels must comply with heat release and smoke emission requirements, even if they were attached to a seat. If the FAA had not issued such policy, seat designs could have been viewed as a loophole to the airworthiness standards that would result in an unacceptable decrease in survivability during a cabin fire event.

In October of 2004, an issue was raised regarding the appropriate flammability standards for passenger seats that incorporated non- traditional, large, non-metallic panels in lieu of the traditional metal covered by fabric. The Seattle Aircraft Certification Office and Transport Standards Staff reviewed this design and determined that it represented the kind and quantity of material that should be required to pass the heat release and smoke emissions requirements. We have determined that special conditions would be promulgated to apply the standards defined in 14 CFR 25.853(d) to seats with large, non-metallic panels in their design.

### **Applicability**

As discussed above, these special conditions apply to Airbus A350-900 series airplanes. Should Airbus apply later for a change to the type certificate to include another model



incorporating the same novel or unusual design feature, the special conditions would apply to that model as well.

## **Conclusion**

This action affects only certain novel or unusual design features on Airbus A350-900 series airplanes. It is not a rule of general applicability.

## **List of Subjects in 14 CFR Part 25**

Aircraft, Aviation safety, Reporting and recordkeeping requirements.

The authority citation for these special conditions is as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701, 44702, 44704.

## **The Special Conditions**

So, by the authority delegated to me by the Administrator, the following special conditions are issued as part of the type certification basis for Airbus A350-900 series airplanes with passenger seats that have non-traditional, large, non-metallic panels.

1. Compliance with 14 CFR part 25 Appendix F, parts IV and V, heat release and smoke emission, is required for seats that incorporate non-traditional, large nonmetallic panels that may either be a single component or multiple components in a concentrated area in their design.
2. The applicant may designate up to and including 1.5 square feet of non-traditional, nonmetallic panel material per seat place that does not have to comply with No. 1. A triple seat assembly may have a total of 4.5 square feet excluded on any portion of the assembly (e.g., outboard seat place 1 sq. ft., middle 1 sq. ft., and inboard 2.5 sq. ft.)

3. Seats need not meet the test requirements of 14 CFR part 25 Appendix F, parts IV and V when installed in compartments that are not otherwise required to meet these requirements. Examples include:
  - a. Airplanes with passenger capacities of 19 or less,
  - b. Airplanes exempted from smoke and heat release requirements.

Issued in Renton, Washington, on March 14, 2012

John Piccola, Acting Manager  
Transport Airplane Directorate  
Aircraft Certification Service

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